

Patent Claims

1. An arrangement used for securing a fan frame (2) to a heat exchanger (3), the heat exchanger (3) having at least one header (8, 9) with holding means (16, 17, 18, 19), and the fan frame (2) having a framework (2a, 2b, 2c, 2d) with securing means (20, 21, 22, 23) and with at least one additional rib (14, 15) for stiffening, the holding means of the header (8, 9) being in operative contact with one another by the securing means of the framework.

2. The arrangement used for securing a fan frame (31) and/or additional heat exchangers to a heat exchanger (32), in particular as claimed in claim 1, the heat exchanger (32) having at least one header (33, 34) with holding means and supporting means for a support of the heat exchanger on an abutment, and the fan frame and/or the additional heat exchangers having at least one supporting device for supporting the fan frame and/or the additional heat exchangers on the abutment and securing means, the holding means of the heat exchanger and the securing means of the fan frame and/or of the additional heat exchangers being in operative contact with one another.

3. The arrangement as claimed in one of the preceding claims, characterized in that the fan frame (2) and/or the additional heat exchangers are secured solely to the header or headers (8, 9) of the heat exchanger (3).

4. The arrangement as claimed in one of the preceding claims, characterized in that the header is arranged laterally on the heat exchanger, and the securing means are arranged laterally on the fan frame and/or the additional heat exchanger.

5. The arrangement as claimed in one of the preceding

claims, characterized in that the heat exchanger has two headers which are arranged, in particular, on opposite sides of the heat exchanger.

5 6. The arrangement as claimed in one of the preceding claims, characterized in that an additional rib of the fan frame is arranged between two headers of the heat exchanger, in particular in an edge region of the fan frame.

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7. The arrangement as claimed in one of the preceding claims, characterized in that the additional rib (14, 15) has a length which corresponds to the distance between two headers (8, 9).

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8. The arrangement as claimed in one of the preceding claims, characterized in that an additional rib (13, 14) has a depth (X) which corresponds approximately to the depth of the tube/rib block of the heat exchanger.

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9. The arrangement as claimed in one of the preceding claims, characterized in that the depth X of an additional rib (14, 15) is variable along the rib and has a maximum X1 at mid-length.

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10. The arrangement as claimed in one of the preceding claims, characterized in that the additional rib (14, 15) has essentially the same wall thickness as the framework (2a, 2c) of the fan frame (2).

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11. The arrangement as claimed in one of the preceding claims, characterized in that one or more additional ribs, (14, 15) cover a tube/rib block (3a) of the heat exchanger.

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12. The arrangement as claimed in one of the preceding claims, characterized in that the fan frame (2) is produced as a plastic part and the additional rib (14,

15) can be injection-molded onto the framework (2a, 2c).

13. The arrangement as claimed in one of the preceding
5 claims, characterized in that the supporting means
comprise a securing tenon.

14. The arrangement as claimed in the preceding
claims, characterized in that the securing means of the
10 fan frame and/or of the additional heat exchangers can
be inserted and/or latched into the holding means of
the header or the holding means of the header can be
inserted and/or latched into the securing means of the
fan frame and/or of the additional heat exchangers.

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15. The arrangement as claimed in one of the preceding
claims, characterized in that the holding means on one
header (8) are designed as holders (16, 17) with
insertion orifices and on another header (9) as snap
20 hooks (18, 19), and in that the securing means on the
fan frame (2) are designed on one side (2b) as
insertion tabs (20, 21) and on the opposite side (2d)
as securing tabs (22, 23) with latching orifices, and
in that the fan frame (2) can be inserted with the
25 insertion tabs (16, 17) into the holders (20, 21), can
subsequently be folded and can be latched by means of
the snap hooks (18, 19) and the securing tabs (22, 23).

16. The arrangement as claimed in one of the preceding
30 claims, characterized in that the securing means (A, B)
are designed as tabs of the fan frame (31) and the
holding means on the header (33, 34) are designed as
snap hooks.

35 17. The arrangement as claimed in one of the preceding
claims, characterized in that the securing means of the
fan frame (31) are designed as ribbed feet (52, 56)
injection-molded onto the framework in the lower

region, and in that the holding means on the header (33, 34) are designed as reception orifices (51, 55), and in that the feet (52, 56) can be pushed into the reception orifices (51, 55).

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18. The arrangement as claimed in one of the preceding claims, characterized in that snap hooks (53, 57) are arranged on the feet (52, 56) and edges (54, 58) are arranged on the reception orifices (51, 55), and in
10 that the snap hooks can be latched with the edges.

19. The arrangement as claimed in one of the preceding claims, characterized in that the foot (52) with the reception orifice (51) is designed as a fixed bearing
15 and the foot (56) with the reception orifice (55) is designed as a loose bearing.

20. The arrangement as claimed in one of the preceding claims, characterized in that the securing tenons (35,
20 36) are arranged below the reception orifices (51, 55).

21. The arrangement as claimed in one of the preceding claims, characterized in that the supporting means of the heat exchanger and the supporting device of the fan
25 frame and/or of the additional heat exchangers are arranged in a common securing region (C, D) and, in particular, are integrated in one another.

22. The arrangement as claimed in one of the preceding
30 claims, characterized in that the fastening means of the fan frame (31) and the holding means of the header (33, 34) are arranged in the adjacent region of the supporting means (35, 36) and, in particular, form the common securing regions (C, D).

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23. The arrangement as claimed in one of the preceding claims, characterized in that the heat exchanger is a coolant cooler, in particular for motor vehicles.

24. The arrangement as claimed in one of the preceding claims, characterized in that the coolant cooler (3) is part of a cooling module (1) for a motor vehicle.

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25. The arrangement as claimed in one of the preceding claims, characterized in that the abutment is part of a motor vehicle framework.

10 26. A fan frame, in particular for an arrangement as claimed in one of the preceding claims, which has a framework with securing means and at least one additional rib.

15 27. The fan frame as claimed in claim 26, characterized by an approximately rectangular horizontal projection.